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United States Department of Agriculture  
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A HAND-OPERATED SHAKER FOR SIFTING SOIL

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Investigations 1/

A portable, hand-operated shaker for sifting soil is frequently needed in the course of investigations having to do with soil insects. Such a device should be (1) as light as possible in weight to facilitate carriage in the field, (2) it should hold the sieves high enough to be reached conveniently by a worker from a standing position, and (3) it should be readily collapsible for transportation or storage. The shaker herein described and illustrated meets the above requirements and has proved satisfactory under a variety of conditions.

The construction of the shaker is shown in figure 1, and the complete sifting apparatus set up and ready for use in figure 2. The flexible upright piece shown in C of figure 1 is made of a flat piece of spring steel having the dimensions  $1/4"$  by 2" by 40". This member is given a one-quarter twist near the base which permits the sieves to be shaken in a direction parallel to the long arm of the wooden base, and also allows some motion in a sidewise direction so that a rotary motion may be given to the sieves if desired. When in use the upright piece fits into a metal sheath in the base as shown, no bolt being required to hold it. Two brackets for holding the sieves are brazed to the upper end of this upright piece. The base consists of 3 pieces of 2" by 6" lumber hinged together with heavy strap hinges. Each of the 2 shorter arms of this base is equipped with a metal keeper (fig. 1, K), into which a flange of the angle iron B fits, locking the arms rigidly in position. On removal of this bar the base folds up, as shown in figure 3 and in A of figure 1.

1/ The drawings were made by L. V. Burcham of the Parma, Idaho, Laboratory.

In sifting soil 2 sieves are ordinarily used, the upper one having 6 meshes and the lower one 12 or 16 meshes to the inch. The hook shown at H in figure 1 holds the lower sieve so that it does not fall out while the soil is being placed in the screen. This overhanging hook is important, and there should be good clearance so that the sieve slips in without binding. The sieves used have outside measurements of  $24\frac{1}{4}$  by  $23\frac{1}{4}$  by  $2\frac{1}{4}$  inches. The upper sieve merely sits on the lower one, no particular arrangement being necessary to hold it in position. However, the upright hook on the rear supporting bracket projects slightly above the bottom sieve so that it also holds the top one.

In shaking the sample of soil, both sieves are grasped and shaken back and forth, a motion readily permitted by the flexibility of the upright piece of steel. The weight of the base is sufficient to keep the apparatus fairly steady during the sifting, but further stability is imparted by resting a foot on the forward end of the middle support, as shown in figure 2. The top sieve is set aside after the soil has passed through it, and sifting is completed by use of the lower sieve.

A sample of 12 quarts of soil may be handled at one time, and one man can sift and examine about 10 such samples per hour. The complete equipment, consisting of a post-hole auger for digging the samples, the shaker, and the sieves, may be carried from place to place in the field by one man. The shaker is not knocked down between moves in the same field, but the sieves are removed.

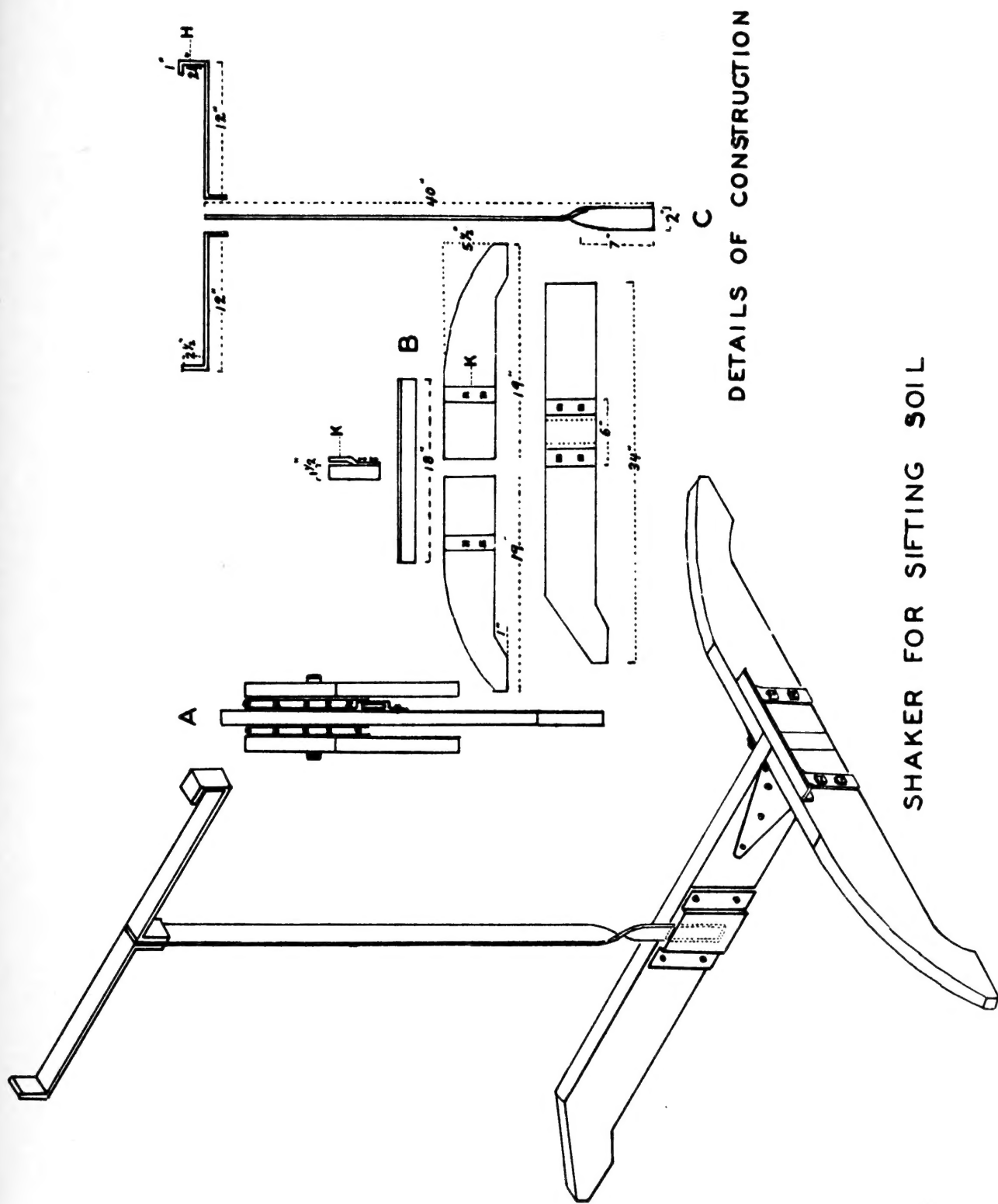


Figure 1.—Details of the hand-operated soil sifter.



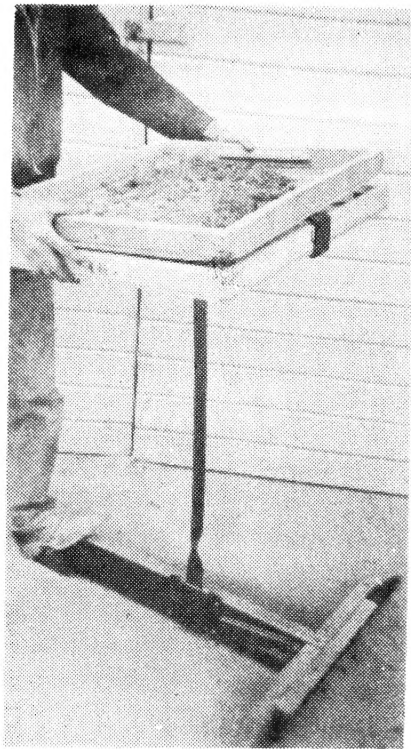


Figure 2.—Soil sifter in use.

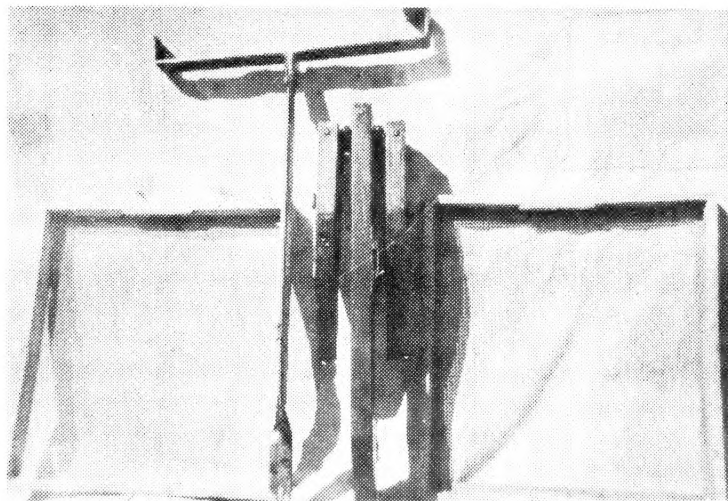


Figure 3.—Shaker (folded) and sieves.

